Review of: "Risk Factors for 28-Day in-Hospital Mortality in Mechanically Ventilated Patients with COVID-19: An International Cohort Study"

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The authors collect data from a cohort of COVID-19 patients requiring mechanical ventilation. This is a very large cohort, with 1713 patients, 148 ICUs collaborate, from 33 countries spread over all continents. This is a prospective observational study to try to define risk factors for mortality in this population. Data are collected following a protocol that is limited to clinical data, data related to mechanical ventilation, and data about the administered treatments.

Patients were recruited in 2020. The primary outcome was mortality at day 28 after the start of mechanical ventilation.

The authors identify advanced age and low PEEP as risk mortality factors established at the beginning of mechanical ventilation. The factors that predicted mortality based on their changes during the days of mechanical ventilation were increases in creatinine, lactate and PaCO2. The protective factors were the increases in pH, PaO2 / FiO2 and mean arterial pressure. They also found significant geographic mortality differences.

The research is well thought out, the design is correct, and the article is well written.

Only relatively minor observations

No radiological or detailed laboratory data are collected beyond those of respiratory physiology. Nor are data provided about whether it is the wild strain and the incidence of variants. The incidence of new variants could change these results, so their extrapolation to the current moment should be cautious.

Only 50% of the patients received corticosteroids. No data are provided on how many patients were treated with other immunomodulators such as tocilizumab. The almost universal use of these drugs, at least in Europe, adds to the idea that the data must be extrapolated with care. Currently most of the cases of severe COVID-19 that are admitted to the ICU correspond to vaccinated elderly people, a population quite different from the one studied and which could have some differences. It would not be bad for the authors to consider these aspects in the limitations of the study.

Figures 2, 4, 5 and 6 are very small and cannot be read. So small that if you try to increase their size they blur and cannot be read either.

And the final question is on novelty. All this study to conclude that patients do worse the older they are, that the more creatinine, lactate and PaCO2 increase, the more they die and that the better their

hemodynamic situation (mean arterial pressure), metabolic balance (pH) and oxygenation (PaO2 / FiO2), the better prognosis they have.

The results seem finally somewhat poor. They are too predictable, some of them (age) quite well established, others quite obvious (as hypoxia increases mortality increases) and altogether they are not very helpful. For such an effort we would have expected a more imaginative analysis.